PHOTOGRAPHERS' FORMULARY INC.

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THE PYROCAT-HD DEVELOPER

CAT. NUMBER 01-5080 TO MAKE 10 LITERS
CAT. NUMBER 01-5081 LIQUID TO MAKE 10 LITERS
CAT. NUMBER 01-5082 TO MAKE 50 LITERS
CAT. NUMBER 01-5083 LIQUID TO MAKE 50 LITERS
OF WORKING SOLUTION

Pyrocat-HD is a semi-compensating, high-definition developer, formulated by Sandy King as an alternative to PMK. The advantages over PMK that Mr. King cites for his formula include an approximately 1/3-stop greater effective film speed, 10-15% shorter development times, more consistent staining action, lower toxicity, and no streaking or mottling with reduced agitation.

FOR YOUR CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warnings listed here. Always use rubber gloves and dust mask when using chemicals.

Catechol (pyrocatechin), has a high vapor pressure and it is a phenol. The high vapor pressure means that solid catechol evaporates readily. When you open a bottle containing solid catechol, you can smell it. Always store solid catechol in a tightly capped glass container. When mixing a solution containing catechol, work in a ventilated area. When catechol is in solution, its high vapor pressure is not a problem.

The fact that catechol is a phenol means that it is corrosive and can cause skin burns. If you should spill a solution of catechol, wash the area (or skin) with soap and water. Use tongs or rubber gloves whenever possible when working with this compound or its solutions.

The user assumes all risks upon accepting these chemicals. IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS WITHIN 30 DAYS FOR A FULL REFUND.

Please consult with local sewer and water authorities regarding proper disposal of darkroom chemicals in your area.

Stock Solution A

Distilled Water (125°F)	**75 ml**	**375 ml**
Sodium Bisulfite	1 g	5 g
Pyrocatechin	5 g	25 g
Phenidone	.2g	1 g
Potassium Bromide	.2g	1 g
Water to make (68°F)	100 ml	500 ml

Stock Solution B

Distilled Water (68°F)	**75 ml**	**375 ml**
Potassium Carbonate	75 g	375 g
Water to make (68°F)	100 ml	500 ml

To make a standard working solution mix 1 part A with 1 part B with 100 parts water.

Mr. King's experiments have centered on sheet film, as he works primarily in large format (4x5, 5x7, 7x17, and 12x20). His development recommendations are as follows:

Sheet film in trays, normal agitation: standard working solution, with agitation for 10 seconds every minute (or 5 seconds twice per minute), 70º F.

Sheet film in trays, minimal agitation: standard working solution, with agitation for 10 seconds every three minutes, 70º F. Development times are approximately 50% longer than for normal agitation.

Sheet film in trays, semi-stand agitation: special working solution of 1 part A with 1 part B with 200-400 parts water. Agitation is for one minute at start of development, followed by 30 seconds at the halfway point. Development time for slow and medium-speed films is 40-50 minutes, 70º F. Development time for fast films is 50-60 minutes. Dichroic fog may result from extended development of high-speed films. If this is a problem in your work use a 1:1: 200 dilution and reduce development to about 30 minutes.
Sheet film in rotary processor, continuous agitation: use a minimum of 75 ml of the standard working solution per sheet of 4x5 film (or equivalent for larger formats).

Recommended developing times for sheet film in rotary processor are as follows: FP4+ (EI 100) for 8 minutes, BPF-200 (EI 100) for 9 minutes, T-MAX 400 (EI 320) for 12 minutes, and HP5+ (EI 320) for 13 minutes, all at 70º F.

Presoak film for two minutes. Use a plain water stop bath for one minute. Use an alkaline fixer (rapid fix without hardener) for 5 minutes. Wash in running water for 10-15 minutes.

The working solution can be made quite a bit more energetic (faster working) by doubling the amount of B solution. For example, with a 1:1:100 dilutions, Ilford FP4+ develops to a CI of .52 in 8 minutes. With a 1:2:100 dilution, development time to the same CI is only 5:30. This fact makes the 1:2:100 dilutions very useful for zonal expansion, especially for negatives intended for use with alternative processes.
Note: The formula provided here differs from the one published in Post-Factory Photography, issue number 4.Mr. King has modified solution B to use a 100% solution of potassium carbonate instead of a 10% solution of sodium carbonate. An earlier version of the formula published on the rec.photo newsgroup called for .25 grams of metol in place of the phenidone. Mr. King suggests that this formulation may be more stable than the phenidone version. The keeping time for solution A when formulated with phenidone is about 6 months.

Test Results with 120 Roll Film
By Ed Buffaloe

I'm not running a scientific test here. I shoot, develop, print and see if the results were worth the trouble. Thus far, I have been very satisfied with Pyrocat-HD. Since I don't have a densitometer, I can't measure densities to see if I am really getting a one-third-stop speed increase. My Pyrocat negatives are really pretty--very clean, sharp, high-acutance images. One thing that I am doing is taking advantage of Pyrocat's even development to reduce agitation to once per minute for 10 seconds (whereas for PMK I use twice per minute for 5 seconds each). When I wrote to Sandy King to tell him of my preliminary results, he responded as follows:

My original tests indicated that Pyrocat-HD with the 1:1:100 dilution required slightly shorter development times than PMK, but those tests were all done with sheet film and constant agitation in tubes (floating them in a water bath). However, Pyrocat is a much more energetic developer if diluted 1:2:100 and I use this dilution for all of my development of 7x17 and 12x20 film, which are intended for printing with the carbon process. The 1:2:100 dilutions also work well for zonal expansion of about 2 steps, keeping time and temperature the same.

My first test with 8x10 sheet film photographs (click here to see the results) indicated that the developing times for PMK and Pyrocat-HD would be very similar. I think you could go to my chart of developing times for PMK and use them for Pyrocat-HD as a starting point. That is exactly what I have been doing. What follows is a chart of films I have tested so far and the times I recommend. The bolded times are the ones I actually used.

Film	**EI**	**70º**	**75º**	**80º**
Ilford HP-5+	200	13 min	10 min	8 min
Kodak T-Max 100	64	14 min	11 min	9 min
Kodak T-Max 400	400	15 min	12 min	10 min
Kodak Verichrome Pan	125	9 min	7.5 min	6 min

I have begun using Pyrocat-HD interchangeably with PMK. Particularly favor it for sheet film, as I like to get my fingers in the soup, which isn't possible with PMK because of its toxicity.

One difference between PMK and Pyrocat-HD is that PMK's stain has a strong yellow color, which inhibits blue and magenta. When printing on graded paper, the yellow stain essentially adds more density to the negative and boosts the contrast. When printing on variable contrast paper, the yellow stain tends to reduce contrast, particularly in the high values. These effects can be good or bad, depending on the negative. Pyrocat-HD's stain is brown in color. Pyrocat negatives seem to me to print much like PMK negatives on VC papers, but they require less exposure on graded papers than similar PMK negatives, because the brown stain doesn't inhibit the blue light that the paper is sensitive to as much as a yellow stain would.

Semi-Stand Development

I had a roll of Delta 3200 from my recent vacation that I was pretty sure I had underexposed. I wanted to try to salvage it, so I used Pyrocat-HD with semi-stand development. I gave it 30 minutes development in Pyrocat-HD diluted 1:1:200 at 70º F.I agitated for one minute at the beginning and 30 seconds in the middle of development. Not only is the roll printable, it has extremely high acutance--the prints from it appear almost un-really sharp.(I developed another roll using semi-stand development, only this roll was of a very high-contrast scene, and I thought I could reduce contrast using this development method. But the bromides released by the intense development in the heavily exposed areas diffused out and caused uneven development in surrounding areas. The roll was ruined and I lost some great shots.)